

4/3/09 CP

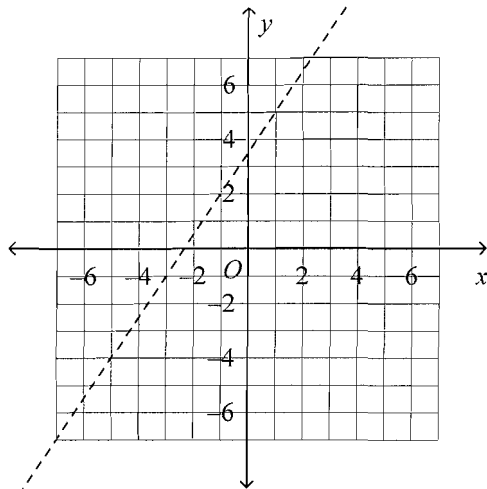
Multiple Choice*Identify the choice that best completes the statement or answers the question.***Solve the equation.**

- _____ 1. $3|3x + 4| - 7 = 5$
- a. $x = \frac{8}{9}$ or $x = -\frac{2}{9}$ c. $x = \frac{8}{9}$ or $x = -2\frac{2}{3}$
- b. $x = 0$ or $x = -2\frac{2}{3}$ d. $x = \frac{8}{9}$ or $x = 0$
- _____ 2. $9x^2 + 16 = 0$
- a. $-\frac{4}{3}i, \frac{4}{3}i$ c. $-\frac{3}{4}i, \frac{3}{4}i$
- b. $-\frac{16}{9}i, \frac{16}{9}i$ d. $-\frac{4}{3}, \frac{4}{3}$
- _____ 3. Suppose $f(x) = 4x - 2$ and $g(x) = -2x + 1$.
- Find the value of $\frac{f(5)}{g(-1)}$.
- a. -2 b. 2 c. $\frac{2}{3}$ d. 6
- _____ 4. through $(-2, -5)$ and perpendicular to $y = -\frac{1}{2}x + 1$.
- a. $y = 2x - 1$ b. $y = -\frac{1}{2}x - 6$ c. $y = \frac{1}{2}x - 4$ d. $y = -2x - 9$
- _____ 5. The distance traveled at a constant speed is directly proportional to the time of travel. If Olivia traveled 50 miles in 2.5 hours, how many miles will Olivia travel in 3.8 hours at the same constant speed?
- a. 43.7 mi b. 56.3 mi c. 26 mi d. 76 mi

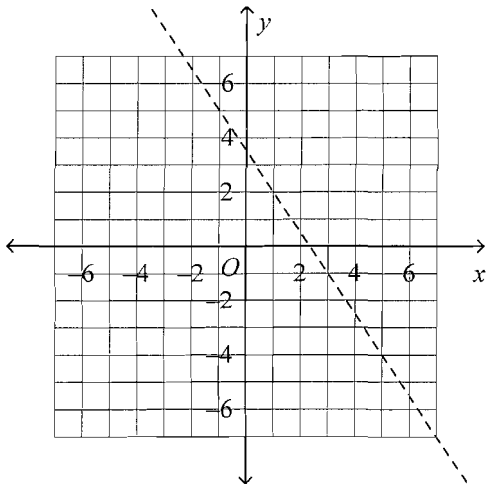
Graph the inequality.

_____ 6. $-3x + 2y < 7$

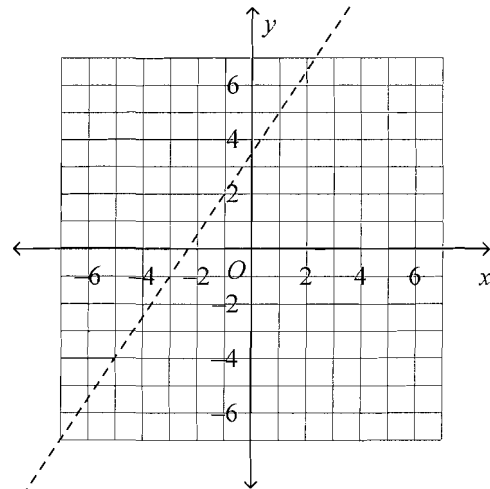
a.



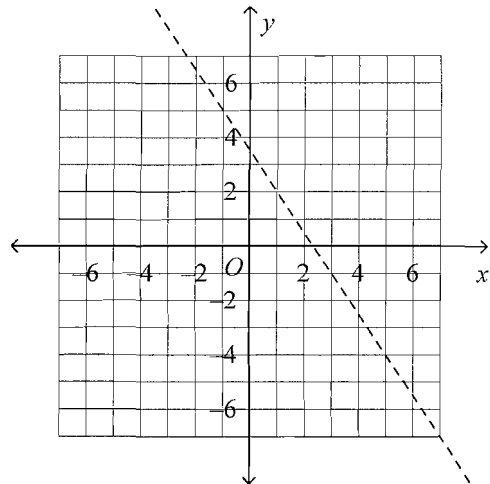
b.



c.



d.

**Use the elimination method to solve the system.**

_____ 7.
$$\begin{cases} -x + 2y = 10 \\ -3x + 6y = 11 \end{cases}$$

a. infinite solutions

b. $(-5, 2)$ c. $(5, -2)$

d. no solutions

Foil

_____ 8. $f(x) = (3x + 5)(-4x - 3)$

a. $15x^2 + 27x - 15$ b. $-29x - 15$ c. $-12x^2 - 15$ d. $-12x^2 - 29x - 15$

____ 9. Solve by factoring.

$$3x^2 + 8x - 60 = 0$$

a. $-6, 3$

b. $-6, \frac{10}{3}$

c. $6, -\frac{1}{2}$

d. $\frac{10}{3}, -\frac{1}{2}$

____ 10. Find the missing value to complete the square.

$$x^2 + 2x + \underline{\hspace{1cm}}$$

a. 2

b. 1

c. 4

d. 8

Rewrite the equation in vertex form.____ 11. $y = x^2 + 10x + 16$

a. $y = (x + 5)^2 + 41$

c. $y = (x + 10)^2 + 11$

b. $y = (x + 10)^2 - 9$

d. $y = (x + 5)^2 - 9$

Solve the equation.____ 12. $-2x^2 + x + 8 = 0$

a. $\frac{1}{4} \pm \frac{\sqrt{65}}{4}$

c. $\frac{1}{2} \pm \frac{\sqrt{65}}{2}$

b. $4 \pm \frac{\sqrt{130}}{4}$

d. $\frac{1}{4} \pm \frac{\sqrt{32}}{2}$

Simplify the expression.____ 13. $(-3)^{-2}$

a. $-\frac{1}{9}$

b. $\frac{1}{9}$

c. 6

d. 9

____ 14. $(3xy^3)^2(xy)^6$

a. $9x^8y^{12}$

b. $3x^8y^{12}$

c. $2x^3y^{12}$

d. $9x^8y^9$

____ 15. Find the zeros of $y = x(x - 3)(x - 2)$.

a. $3, 2, -3$

c. $3, 2$

b. $0, -3, -2$

d. $0, 3, 2$

____ 16. Write a polynomial function in standard form with zeros at 5, -4, and 1.

a. $f(x) = x^3 - 2x^2 - 19x - 9$

c. $f(x) = x^3 - 21x^2 + 60x - 9$

b. $f(x) = x^3 - 2x^2 - 19x + 20$

d. $f(x) = x^3 + 20x^2 - 2x - 19$

- _____ 17. An initial population of 895 quail increases at an annual rate of 7%. Write an exponential function to model the quail population.
- a. $f(x) = 895(1.07)^x$ c. $f(x) = 895(0.07)^x$
b. $f(x) = 895(7)^x$ d. $f(x) = (895 \cdot 0.07)^x$
- _____ 18. Find the annual percent increase or decrease that $y = 0.35(2.3)^x$ models.
- a. 230% increase c. 30% decrease
b. 130% increase d. 65% decrease
- _____ 19. For an annual rate of change of -31% , find the corresponding growth or decay factor.
- a. 0.31 b. 0.69 c. 1.31 d. 1.69
- _____ 20. Suppose you invest \$1600 at an annual interest rate of 4.6% compounded continuously. How much will you have in the account after 4 years?
- a. \$800.26 b. \$6,701.28 c. \$10,138.07 d. \$1,923.23

Write the equation in logarithmic form.

- _____ 21. $6^4 = 1,296$
- a. $\log_6 1,296 = 2$ c. $\log 1,296 = 4 \cdot 6$
b. $\log 1,296 = 4$ d. $\log_4 1,296 = 6$

Evaluate the logarithm.

- _____ 22. $\log_5 \frac{1}{625}$
- a. -3 b. 5 c. -4 d. 4

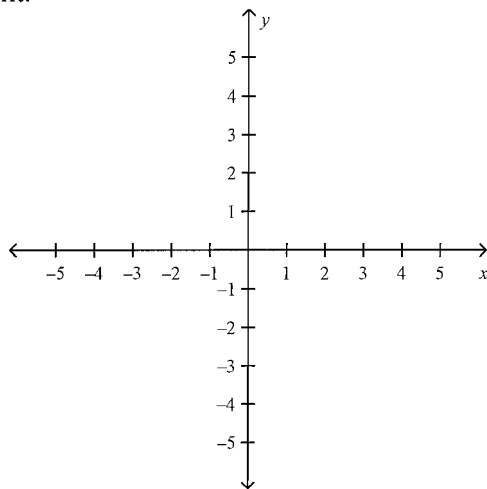
Write the expression as a single logarithm.

- _____ 23. $5 \log_b q + 2 \log_b y$
- a. $\log_b (q^5 y^2)$ c. $\log_b (q^5 + y^2)$
b. $(5 + 2) \log_b (q + y)$ d. $\log_b (qy^{5+2})$

Completion*Complete each statement.*

24. Graph $y = \frac{-1}{2}(x+5)^2 - 3$

Identify the vertex,
axis of symmetry and
one additional point.

**Short Answer**

25. Is the relation $\{(-5, -4), (1, -4), (4, -2), (-1, 4), (-2, -4)\}$ a function? Explain.

Essay

26. A model for the height of a toy rocket shot from a platform is $y = -16x^2 + 145x + 7$, where x is the time in seconds and y is the height in feet.

- Find the zeros of the function.
- About how high does the rocket fly before hitting the ground? Explain.

Other

27. In a particular region of a national park, there are currently 330 deer, and the population is increasing at an annual rate of 11%.
- Write an exponential function to model the deer population.
 - Explain what each value in the model represents.
 - Predict the number of deer that will be in the region after five years. Show your work.